

WHAT IS CLAIMED IS:

sub a' 1. A core plate assembly [for a nuclear reactor,] the reactor comprising a plurality of large control rods, a plurality of cruciform shaped control rod guide tubes, and a plurality of fuel bundles having lower tie plates; said core plate assembly comprising:

5 a flat plate;

a plurality of support beams, said flat plate positioned on top of said support beams;

10 a plurality of control rod guide tube openings, each said guide tube opening sized to receive a control rod guide tube, said control rod guide tube openings arranged in staggered rows;

a plurality of fuel supports extending through said flat plate, each said fuel support comprising:

a coolant flow inlet;

15 a coolant flow outlet sized to receive a lower tie plate of a fuel bundle; and

a coolant flow bore extending between said coolant flow inlet and said coolant flow outlet, said coolant flow inlet offset from said coolant flow outlet so that a centerline of said coolant flow inlet is parallel to a centerline of said coolant flow outlet.

20 2. A core plate assembly in accordance with Claim 1 wherein said guide tube openings have a cruciform shape and comprise four slots extending radially from a central portion at right angles to each other, said slots defining four fuel bundle receiving areas.

25 3. A core plate assembly in accordance with Claim 1 wherein each said coolant flow inlet comprises an orifice plate.

4. A core plate assembly in accordance with Claim 2 wherein said coolant flow inlets are positioned adjacent a support beam, and said coolant flow outlets are positioned in a fuel bundle receiving area.

5. 5. A core plate assembly in accordance with Claim 2 wherein each said fuel bundle receiving area comprises four fuel supports.

6. A core plate assembly in accordance with Claim 2 wherein each said fuel bundle receiving area comprises one fuel support.

7. A core plate assembly in accordance with Claim 2 wherein each fuel support further comprises:

10. four coolant flow inlets;

four coolant flow outlets sized to receive a lower tie plate of a fuel bundle; and

15. four coolant flow bores, each flow bore extending between a corresponding coolant flow inlet and a corresponding coolant flow outlet, said coolant flow inlets offset from said corresponding coolant flow outlets so that a centerline of said coolant flow inlet is parallel to a centerline of said corresponding coolant flow outlet, said coolant flow inlets positioned adjacent a support beam, and said coolant flow outlets positioned in a fuel bundle receiving area.

20. 8. A core plate assembly in accordance with Claim 7 wherein each said fuel bundle receiving area comprises one fuel support.

9. A core for a nuclear reactor comprising:

a plurality of fuel bundles, each fuel bundle comprising a lower tie plate;

a plurality of cruciform shaped large control rods;

25. a plurality of cruciform shaped control rod guide tubes; and

a core plate assembly comprising:

a flat plate;

a plurality of support beams, said flat plate positioned on top of said support beams;

5 a plurality of control rod guide tube openings, each said guide tube opening sized to receive a control rod guide tube, said control rod guide tube openings arranged in staggered rows; and

a plurality of fuel supports extending through said flat plate, each said fuel support comprising:

10 a coolant flow inlet;

a coolant flow outlet sized to receive a lower tie plate of a fuel bundle; and

15 a coolant flow bore extending between said coolant flow inlet and said coolant flow outlet, said coolant flow inlet offset from said coolant flow outlet so that a centerline of said coolant flow inlet is parallel to a centerline of said coolant flow outlet.

10. A core in accordance with Claim 9 wherein said guide tube openings have a cruciform shape and comprise four slots extending radially from a central portion at right angles to each other, said slots defining four fuel bundle receiving areas.

11. A core in accordance with Claim 9 wherein each said coolant flow inlet comprises an orifice plate.

12. A core in accordance with Claim 10 wherein said coolant flow inlets are positioned adjacent a support beam, and said coolant flow outlets are positioned in a fuel bundle receiving area.

13. A core in accordance with Claim 10 wherein each said fuel bundle receiving area comprises four fuel supports.

14. A core in accordance with Claim 10 wherein each said fuel bundle receiving area comprises one fuel support.

5 15. A core in accordance with Claim 10 wherein each fuel support further comprises:

four coolant flow inlets;

four coolant flow outlets sized to receive a lower tie plate of a fuel bundle; and

10 four coolant flow bores, each flow bore extending between a corresponding coolant flow inlet and a corresponding coolant flow outlet, said coolant flow inlets offset from said corresponding coolant flow outlets so that a centerline of said coolant flow inlet is parallel to a centerline of said corresponding coolant flow outlet, said coolant flow inlets positioned adjacent a support beam, and said coolant
15 flow outlets positioned in a fuel bundle receiving area.

16. A core in accordance with Claim 15 wherein each said fuel bundle receiving area comprises one fuel support.